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in seats of learning to be guarded carefully as a pillar of the intellectual universe.

But the student, who has a thorough knowledge of French and German as well as of his own language, still has access through translations to the thoughts of antiquity, while he has vastly more. He has access to the best thoughts of modern times, to the works of authors in all branches of knowledge during this, the age not only of greatest intellectual activity but also of the most accurate investigation. If he be a professional man, he can keep himself abreast with advance; if he have turned aside to commerce, he finds himself equipped for the broader fields; in any case without early training in those languages, he is crippled and is compelled to learn them amid the pressure of other duties. Those languages he must know—without them, he cannot gain admission to graduate schools of our stronger universities. They are as essential as was Latin a century ago and for the same reason—they are, so to speak the tools of trade. In philosophy, law, theology and the various branches of science, a man is at more than serious disadvantage without them.

In all this, there is no denial that a knowledge of Greek and Latin is useful; but that is wholly aside from the issue, which is, whether the gains from the study of classical languages are such as to justify the demand that it retain the very prominent place in the curriculum. The utility of some acquaintance with Latin and Greek is beyond dispute; naturalists employ terms derived from those languages; astronomers and chemists make heavy drafts on mythology, while relics of old practice in law and medicine remain embalmed in Latin terms and phrases. But the knowledge of Greek and Latin necessary] to] the physician, clergyman or lawyer is not great in quantity; if it were, most of the college graduates who have] taken] up those professions would

feel themselves sadly handicapped. Indeed, a 'smattering' is all that very many energetic writers demand.

Elementary courses in Hebrew, Arabic, Assyrian, Italian and Spanish are given in all of our larger institutions and, in many, the opportunity is still afforded for the beginner in French and German. Similar courses, as options, ought to be offered in Latin and Greek, planned to give a good knowledge of the vocabulary and to acquaint the student with that something, which we are accustomed to call the 'genius' of the language. A faithful student, with an object in view, should be able in two years to read, with comparative ease, any ordinary work in either of those languages. Certainly, no one will assert that Latin and Greek are more difficult than German or that the idioms are more perplexing than those of Spanish. Scientific men understand this, for there are doubtless few who have not been compelled to acquire at short notice a working knowledge of an additional language in order to prosecute an investigation already begun.

When our college curricula shall have been properly adjusted, the graduate will have received the polish obtained by study of language and literature, the logical mode of thought obtained by study of mathematics, the knowledge, strength and judicial tendency obtained by study of the inductive sciences; while in addition, he will have the means to utilize his gains in the profession or calling which has been in view during the later years of his college life.

JOHN J. STEVENSON.

*THE BULLETIN OF THE AMERICAN MUSEUM
OF NATURAL HISTORY.*

IN 1881 Professor R. P. Whitfield saw that the scientific needs of this Museum, its reputation amongst kindred institutions in the world, and its proper recognition of its natural responsibility to the world of

science, as well as the obvious advantages to itself, demanded that some scientific publication should be begun. Publications were commonly considered invariable concomitants of Museum life. The Museum of Comparative Zoology, under Louis Agassiz, began its important series of Bulletins in 1863, and later enlarged the work of investigation by instituting the Memoirs, begun in 1864. The Bulletins were largely at first devoted to systematic work but this was soon gradually invaded and partially displaced by biological studies and such admirable geological and physiographic papers as R. T. Hill's *Geology and Physical Geography of Jamaica*. A. Agassiz's study of the Fiji Islands and the Three Voyages of the *Blake* appeared.

The Museum of Comparative Zoology boasted of an extraordinary group of students, and the inception of a bulletin or some other form of publication was inevitable. Here A. E. Verrill, S. H. Scudder, J. A. Allen, Jeffries Wyman, Wm. Stimpson, A. S. Packard, J. G. Anthony, Alpheus Hyatt, W. H. Niles, A. Agassiz, F. W. Putnam, O. St. John, C. F. Hartt, L. F. de Pourtales, Theodore Lyman, P. R. Uhler, U. S. Shaler, Horace Mann, W. H. Dall, A. S. Bickmore were likely, from their superabundant enthusiasm and industry, as well as the unflagging zeal of their leader Louis Agassiz, soon to demand a printed page for their results in various fields of natural science. It is in much more recent years that these splendid publications have been continued on a biological line, by Folsom, Bouvier and Fischer, Mayer, and A. Agassiz, Hamaker, Galloway, Bancroft, Parker, Gerould, Wilcox, Vennings, Meyer, and Neal.

Yet, under the most favorable conditions for the supply of material, the early volumes of the Museum of Comparative Zoology did not equal in size the first Bulletins of the American Museum of Natural History.

The Memoirs of the Museum of Comparative Zoology embodied more elaborate contributions to science in the form of quarto volumes, in which such notable studies as Allman's *Hydroids*, Agassiz's *Echini* and *Acalephs*, Faxon's *Stalk-eyed Crustacea* appeared.

The Peabody Museum of American Archaeology and Ethnology publish Annual Reports embracing some scientific information, miscellaneous papers, and Memoirs. The Peabody Museum of Yale University publishes Memoirs, the Field Museum of Chicago engages in the publication of papers in its various departments. In New York, the Reports of the Regents of the University of the State of New York, on the condition of the State Cabinet of Natural History, had been long established. This last important series had been the depository of scientific papers and afforded an outlet for Professor Hall's paleontological studies which otherwise would have suffered partial suppression. These Reports have been succeeded by the Reports of the Museums, filled with useful and often elaborate and comprehensive treatises on questions in State Geology, Paleontology and Botany.

The Smithsonian Institution and the National Museum have been prolific sources of published material, and the Museums in Europe have issued numerous studies and periodical papers.

It would indeed be very obvious to any thoughtful mind that the Museum could not long maintain a self-respecting attitude towards the world of science, nor bring itself into correlation with its own expectations if it did not have a scientific publication. Besides, there were substantial benefits of another sort to be secured. The Bulletin or whatever other publication was finally decided upon would be the means of bringing the Museum into correspondence with societies, institutes, museums, ly-

ceums, throughout the world, with whom a profitable literary exchange could be at once instituted. The Library would be in this way fed and increased. It is difficult, or impossible, without a very considerable expenditure of money to obtain these publications, but in the wide fraternity of scientific workers, their efforts at different stations to solve scientific questions, is mutually appreciated and instantly required. Thus a scientific commerce with the rest of the world would become established. Then it formed naturally the only way in which the Museum's own possessions could be presented to the scientific world, while the inevitable development of expeditions in connection with the institution could only find, by such an avenue of communication, general recognition. A letter from Professor R. P. Whitfield to President Jesup was written urging the usefulness of a scientific publication.

The President accepted the suggestion, and a small appropriation was made for printing some papers, then in Professor Whitfield's hand. At first it was deemed wise that all papers should be submitted to one or two scientific men outside of the Museum who should determine the eligibility of the paper for reproduction. This plan was followed for a short time, but was abandoned as inconvenient and unnecessary. The Curators were made the judges of the character of their own papers, and, as they expected criticism upon the broad impartial stage of the general and special scientific world, they were led to exercise great caution in their judgment. Finally a 'Committee on Publication' was formed by the President, of which officially all curators were members. Their deliberations determine to-day the nature, contents, extent of, and all details connected with the Museum publications. Appropriations of money for this work come under the control of the President of the Executive Committee. With the creation

of new departments, new curators, and the extraordinary accession of material from expeditions, the number of papers pressing for publication increased, and a subsidiary outlet for this overflow was provided in scientific journals, a relief now used by the department of Archæology particularly. A restriction upon this scientific matter had early been instituted by limiting it to museum material, so that, except incidentally, all abstract discussions and scientific polemics, were excluded.

Besides the scientific publications there had been always printed by the Museum, the Annual Report, and occasional Guides to various departments, as the Guide to Invertebrate Paleontology, Guides to Birds and Mammals, and List of Birds found within 50 miles of New York City.

The Guides disappeared as failing in some ways to meet popular needs, but the Annual Reports have increased in size steadily, and are now illustrated reports on the condition of the various departments of the Museum in general, its aims, resources, and needs, being partially composed from the quarterly and annual reports required from the Curators, giving the condition, prospects, and requirements of their various interests.

It was an interesting coincidence that the appearance of the Bulletin was almost synchronous with the beginnings of the Department of Public Instruction. These two features certainly quite effectively give the Museum an educational character, and, in the two fields of popular instruction and scientific work, place its guarantee of good faith in its first pretensions, in the hands of the public.

In giving any epitomization of the contents of the Bulletins the most direct and succinct treatment will be a separation of their contents under the general classes of subjects represented in the various departments of the Museum, as Paleontology (vertebrate and invertebrate), Ornithology

and Mammalogy, Mineralogy and Geology, Conchology, Entomology, Invertebrate Zoology, Ethnology, Archæology, and then a very brief analysis of their contents, under the head of systematic work, investigation, and description of new species. The present number of volumes of the Bulletin is twelve.

The accompanying table shows the distribution of papers in the general departments of science enumerated in the first column. The Memoirs so far published embrace two volumes, as yet incomplete; Vol. I., parts 1, 2, contain papers on Invertebrate Paleontology, parts 3, 4 and 5 on Vertebrate Paleontology; Vol. II., parts 1, 2, contain papers on Ethnology, part 3 on Archæology.

examined by a less superficial and statistical method, the comparative importance of the papers becomes more obvious, and the deceptive results apparent of seeking equalization by enumeration simply. A paper of the far-reaching and suggestive character of Dr. Wortman's treatise on the Ganodonta for instance while counting only as one paper, in labor and intrinsic excellence might justly over-balance a number of less studious or incisive contributions. So perhaps might be instanced Dr. Matthews' paper on the 'Revision of the Puerco Fauna,' Dr. Boas' 'Decorative Art of the Indians of the North Pacific Coast,' Dr. Allen's 'Alleged Changes of Color in the Feathers of Birds without Moulting,' Professor Whitfield's 'Fossils of Lake Champlain,'

BULLETIN-SERIES; ANALYSIS OF CONTENTS.

(Papers Published.)

	1	2	3	4	5	6	7	8	9	10	11	12
Ethnology.....									1	2		2
Archæology.....								3	1			
Mammalogy.....	2	5	15	3	12	9	5	5	9	5		7
Ornithology.....	2	10	5	6	2	1	1	4	2	1		3
Ichthyology and Herpetology.....	2								1	2		
Entomology.....				6	3	4	1	2	3	2		2
Invertebrate Zoology.....										2		1
Conchology.....	1											
Paleontology (vertebrates).....		1	1	3	5	3	4	3	3	6		3
Paleontology (invertebrates).....	10	4	3			1		2	4			
Geology.....	1		1					1				2
Mineralogy.....							1	1				1
Catalogue.....											1	
Pages.....	348	307	441	371	341	368	318	304	375	464		326
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Figs. and cuts.....	8	2	14	29	18	24	39	36	144	76		109

A glance at this table shows the very evenly maintained interest and activity in Mammalogy and Ornithology, a less but noticeable industry in vertebrate and invertebrate Paleontology and Entomology, and the very imperfectly established attention to Geology, Mineralogy, Vertebrate and invertebrate Zoology, the absence of original work in Conchology, and the late contributions in Ethnology and Archæology.

When this series of scientific papers is

and Professor Osborn's papers on fossil mammalia. The character of the articles throughout is thoroughly in keeping with the scientific aims of the institution, but they also of necessity vary in their relative value.

In the three lines of systematic work, description of new species, and investigation, the two first largely preoccupy the attention of the writers, as might be expected. The first issues of the Bulletin were

made at a time when the obvious material at hand was the specimens of the cabinets, and while they afforded theses on taxonomy, nomenclature, revision or description of species, it was not until the new phase of activity introduced by expeditions, allowed a broader range, and actually made investigation imperative, that this last became fully recognized. Amongst the first contributions in this direction was the publication of the interesting results of Professors Seely and Brainard's examination of the eastern shores of Lake Champlain.

These geologists discovered that the Calcareous and Chazy formations have here an unexpected development, and that there aggregate thickness ranges to near 2,500 feet, while a great group of fossil species forms a new and interesting fauna. The descriptions of the fossils from this region which deceived Professor Whitfield by their close resemblance to the Birdseye Limestone, formed perhaps the most important paper in the first volume of the Bulletin. In this paper Professor Whitfield described 33 new species and instituted two new genera of invertebrates, while there was shown to be a lower extension of the Trenton limestone than had been anticipated, mingling its characters with forms having a cambro-silurian expression.

Professors Brainard and Seely followed later in the Bulletin of the Geological Society with a careful analysis of the geological relations of these beds and confessed their own astonishment at the new views they felt compelled to present.

Professor Whitfield also in this first volume of the Museum Bulletin enlarged his important suggestion, previously made in the *American Journal of Science*, that the group of fossils which had been regarded as vegetable in their origin, viz, *Dictyophyton*, *Uphantenia*, *Cyathophycus* etc., were truly spongoid bodies and allied to the *Euplectella* or glass

sponge of modern seas, a view coincided in by Dr. J. W. Dawson.

Professor Whitfield also in this volume of the Bulletin described a 'Fossil Scorpion from the Silurian rocks of America,' the earliest land animal described from American rocks, and of great interest as synchronous with similar discoveries in Sweden and Scotland. It naturally formed a new genus and was also made the type of a new family. Besides these papers a number of others prepared by Professor Whitfield were purely descriptive. In fact the character and value of the first volume of the Bulletin were determined by its geological and paleontological papers, as the other departments in the museum had then scarcely assumed a scientific direction, and their contributions were few and tentative. Amongst these however, Dr. J. A. Allen's paper on 'The Masked Bob-white of Arizona and its Allies' easily ranked first.

In the second volume of the Bulletin a rapid increase of the papers on contemporaneous Natural History is observed, outranking all other contributions. The rare West Indian Seal (*Monachus tropicalis* Gray) was described by Dr. Allen. This remarkable animal had previously only been known to naturalists by an 'imperfect skin, without skull' in the British Museum, and another specimen taken in 1883. In December, 1886, "Mr. Henry L. Ward, of Rochester, son of Professor Henry A. Ward, visited the three little keys off the north-west coast of Yucatan known as The Triangles, for the express purpose of securing specimens of this rare animal."

The Seals were found in considerable numbers but the circumstances were somewhat unfavorable. Forty-nine seals were killed, forty-two of which were taken away, but one of them was lost. From these materials Dr. Allen formed his paper. Papers on Collections of Birds from Ecuador, Bolivia, the Maximilian Types of S. A. Birds,

new species, and seasonal variation in *Elainea* by Dr. Allen and Mr. Chapman with further papers on mammals, furnished the bulk of contributions to this second volume of the Bulletin.

Professor Whitfield published further observations on the Calciferos Sandrock from Lake Champlain, and a description of a fossil barnacle from the Marcellus Shale which challenged attention from the hitherto unrecorded early age for a cirripede in American paleozoics.

The results of expeditions now rapidly appear in the succeeding bulletins, and collections made in Texas, British Columbia, West Indies, Mexico, Costa Rica, furnished many papers on birds and mammals for the third bulletin. Dr. E. A. Mearns contributed four papers on small American mammals, and a few further observations by Professor Whitfield completed this volume. Perhaps the most notable paper in this series was that of Dr. Allen on a 'Review of some of the North American Ground Squirrels of the Genus *Tamias*.'

In volume four of the Bulletin, completed in 1892, Entomology first makes its appearance amongst these papers, a series increased and continued by Mr. Beutenmüller in all succeeding publications of the Museum. These papers were confined to lists, for the most part, of collections in the Museum, and were occasioned largely by the new additions of specimens, secured in the Edwards and Elliott cabinets of insects. One paper of great usefulness was that devoted to Gall-producing Insects within 50 miles of New York City. Vertebrate Paleontology now assumed importance in the Museum, and the wonderful results of the expeditions to the west led to the important papers, in this subject, by Osborn, Wortman, and Matthews, a series developing in later issues to extraordinary interest and permanent importance. In this volume the analysis of *Protoceras* by Professor Osborn

and Dr. Wortman was of especial value; Earle's Revision of *Coryphodon* was a helpful systematic study.

Dr. Allen and Mr. Chapman continued their systematic and descriptive work in ornithology and mammalogy, in which the former's 'Geographical Distribution of North American Mammals' furnished a splendid contribution to zoo-geography and involved a large review of observations, with an authoritative demarcation of the districts and faunas in the mammalian occupation of North America.

Volume fifth of the Bulletin contains systematic and descriptive articles and is conspicuously attractive, though perhaps falling somewhat below its predecessors in interest. Wortman's and Earle's paper on the 'Ancestors of the Tapir' strikes a strong note of original study, and Osborn and Wortman's establishment of a new genus *Artionyx* opened up some new lines of vertebrate relationship. Beutenmüller's 'Descriptive Catalogue of Butterflies found within fifty miles of New York City,' was distinctly useful.

Volume sixth continued the interest which was awakened in volume five. The papers were valuable and involved very diverse topics. The scientific treatment in a few was typical, as in Dr. Wortman's paper on the 'Osteology of *Patriofelis*.'

The articles of this sixth volume formed a very interesting series. A noticeable feature of the Bulletin was supplied by the Department of Vertebrate Paleontology and three papers of importance issued from the pens of Professor Osborn and Dr. Wortman. Amongst these the discussion of the osteology and critical position of *Patriofelis* challenged attention. It revealed an animal living in the later Eocene of aquatic or semi-aquatic habits, provided with powerful jaws, robust teeth, and probably depending on turtles for its subsistence. The Bridger basin swarmed with turtles, and

coprolites, possibly referable to this animal, have been found along its margin, in which turtle remains occur. Dr. Wortman indulges here in an interesting speculation; "when the lake disappeared, it can be conjectured that *Patriofelis* took to the open sea, and finally came to feed upon fish exclusively. It is further conceivable that in their new habitat their swimming power was gradually increased, and, owing to the soft nature of their food, the great strength and power of the jaws were gradually lost, and the teeth became gradually modified into the simple degenerate organs which constitute the dental equipment of the modern seals."

In this volume Mr. Chapman presented a long paper on the Birds of the Island of Trinidad; Dr. Allen furnished seven articles on mammalogy; Mr. Beutenmüller a very useful descriptive catalogue of the Orthoptera, found within fifty miles of New York City, and Professor Whitfield an instructive display of the resemblance to, and probable identity with, modern marine algæ, of Trenton age fossils, previously referred by Hall to graptolites.

Volume seven, in its contributions to science, was most distinguished by the papers it contained on Vertebrate Paleontology. These were the Fossil Mammals of the Puerco Beds, of the Uinta Basin, Perrissodactyls of the Lower Miocene White River Beds, and the Osteology of *Agriochærus*. Dr. Allen provided a careful analysis of Robert Kerr's English translation of 'The Systema Naturæ of Linnæus, as lately published, by the learned Professor Gmelin of the University of Göttingen' issued in 1792, which analysis afforded a useful nomenclatural essay, and belonged to that species of scientific work which may be designated as 'housecleaning.' Kerr's specific and generic names were standardized, and their relevancy or irrelevancy considered. Mr. Beutenmüller gave another

of his useful catalogues of insects found within fifty miles of New York City, this being in this instance the *Sphingidæ* or Hawk-Moths. Dr. Hovey contributed notes on New York Island minerals, and Mr. Chapman ornithological notes on Trinidad Birds. Volume eight of the Bulletin (1896) opened with three articles on changes in the plumage of birds, two studies of the Dunlin, Sanderling and Snowflake by Mr. Chapman, and a short general discussion of 'alleged changes of color in the feathers of birds without moulting' by Dr. Allen. These were possibly occasioned by Gätke's notable proposition that the plumage of birds changed without moulting. Dr. Allen and Mr. Chapman's conclusions constituted a refutation of Gätke's heterodox thesis.

The papers on vertebrate Paleontology were continued, and amongst them Professor Osborn's 'Cranial Evolution of *Titanotherium*' possesses extreme interest. This paper forms a model of conciseness and definite aim. It reveals the accentuation and disappearance of morphological characters, and is a contribution to the demonstration of the plasticity of animal forms. Dr. Wortman, somewhat contrasting in treatment, discusses the species of *Hyracotherium* (fossil horse) and straightens out some of the tangled synonymy of these perissodactyls. A paper of critical interest was Beutenmüller's review of the *Sesiidæ*, or clear winged moths, found in America, north of Mexico, and which was a contribution preliminary to his Memoirs, yet unpublished, on this family.

Archæology appears for the first time in three papers by A. E. Douglass, M. H. Saville, and James Teit, the first being an attempt at a table of geographical distribution of American Indian Relics.

Papers on Mammalogy, Ornithology, Entomology, and invertebrate Paleontology are continued, and the enumeration and notes on Birds in Yucatan, by Mr.

Chapman, seems particularly interesting. The volume closes with a second contribution on the Geology of Lake Champlain, by Professors Brainard and Seely, in which the Chazy beds of that instructive region are especially discussed.

Bulletin nine contains twenty-four articles and was a very exhaustive display of the scientific activity of the corps of research in the Museum. Some papers were of exceptional merit as Dr. Wortman's admirable review of the Ganodonta, a sub-order of the Sloths, Dr. Matthew's revision of the Puerco Fauna, and Dr. Boas' Decorative Art of the Indians of the North Pacific Coast.

In the first Dr. Wortman established the strong probability that the sloths of South America were derived from the Ganodonta of North America; in the second Dr. Matthew revised the Puerco Fauna, and accentuated the 'entire distinctness of the species of the upper and lower beds,' and in the third Dr. Boas painstakingly analyzes the scheme, motive, and meaning of the conventionalized and derivative decorative art of the Indians of the North Pacific coast of America.

The systematic and descriptive papers of J. A. Allen, Frank M. Chapman, William Beutenmüller, were continued. Professor Osborn contributed an authoritative paper on 'The Huerfano Lake Basin, Southern Colorado, and its Wind River and Bridger Fauna.' Professor Whitfield publishes in this volume of the Bulletin a paper of considerable interest, being a description of species of Rudistæ, a remarkable group of Lamellibranchs or bivalves which are only known from the Cretaceous, these here described by Professor Whitfield coming from Jamaica. Professor Whitfield contributed a second paper on the peculiar genus *Barrettia* which Woodward, who instituted the genus, considered, though with hesitation, as a bivalve shell. Professor

Whitfield reverts to Woodward's alternate suggestion that they might be corals, and delicately emphasizes the considerations favoring this view.

A paper of zoological importance was devoted to a preliminary description of a new mountain sheep (*Ovis Stonei*), by Dr. Allen. This attractive ruminant was obtained on the headwaters of the Stickeen River, British N. W. Territory, near the Alaskan boundary, at an altitude of 6500 feet. Color, size and character of horns seem to distinguish it as new.

This volume of the Bulletin contains a description of an extraordinary Terra Cotta figure from the Valley of Mexico which presents a life-size figure of a singing man, with arms extended and mouth opened, dressed apparently in armor. This really effective and striking relic was described by Mr. Marshall H. Saville.

Other papers by Juan Vilaro and Tarleton H. Bean conclude the volume.

The tenth volume of the Bulletin contains a very valuable revision of the Red Squirrels or Chickarees by Dr. Allen, which, in a subject of great difficulty, must rank high amongst these reconstructions of this phylum. Dr. Wortman produced for this volume a masterly study of the 'Extinct *Comelidae* of the U. S.' It perhaps may rank higher than any of this writer's contributions to these bulletins. The conclusions are fragmentary, but the light secured was concentrated upon a difficult and intricate theme. Professor Osborn contributed five papers on vertebrate paleontology of varying interest, but all of scientific importance. To a less technical scrutiny the notes on the great Dinosaur (*Camarasaurus*) seem the most interesting. Mr. Beutenmüller continued his most useful diagnoses of insects (Lepidoptera) with especial reference to those near New York.

Dr. Lumholtz furnished notes on the Huichol Indians of Mexico, and, in con-

junction with Dr. Alës Hrdlicka, a paper upon marked human bones from a Pre-historic Tarasco Indian Burial Place in Michoacan, Mexico. The former, according to the writer were almost an unknown Indian tribe of about four thousand, living in a mountainous country, difficult of access, in the northwestern part of the State of Jalisco, on a spur of the great Sierra Madre. Their great interest arises from their religious proclivities, and while nominally Christians, their peculiar symbolism and intricate ritualistic usages, retain a trace of their pagan character, and in them, it is suspected, there remain relics of the ancient Cuachichilian culture. In this bulletin a paper by Dr. Lumholtz and Hrdlicka on marked human bones revealed an odd practice of marking or notching the bones of the dead. These bones are regarded as trophies "from fallen enemies, and the grooves signified the number slain by the owner of the bone."

Dr. Allen, Mr. Chapman, Dr. Bean, supplied papers on mammals, birds, fishes, and Dr. E. A. Mearns a general study of the fauna of the Hudson Highlands.

Volume eleven of the Bulletin is entirely devoted to a Catalogue of the Type specimens contained in the Hall collection of fossils. The Hall collection contains a great number of the original specimens described in the Paleontology of New York, and a complete list of these is of importance. This Catalogue was prepared by Professor R. P. Whitfield assisted by Dr. E. O. Hovey.

Volume twelve contained twenty-one papers quite evenly distributed amongst the subjects hitherto treated in the Bulletin. Some important additions were made to North American mammals by Dr. Allen from the results of the Constable Expedition to Arctic North America conducted by A. J. Stone. Amongst these were further notes on the new Mountain Sheep (*Ovis*

Stonei), a new Jumping Mouse, four new Voles. Dr. Allen also described in this Bulletin new rodents from the United States and South America; Mr. Chapman reviewed the birds taken on the Peary Expedition to Greenland; Mr. E. W. Nelson gave descriptions of new squirrels from South America; Mr. Gerritt S. Miller of new bats from the West Indies.

A very interesting paper by Dr. Alës Hrdlicka on an 'Ancient Anomalous Skeleton from the Valley of Mexico' revealed human remains having 26 ribs instead of the usual number 24. Furthermore this additional pair of ribs appears to be cervical, as there was found 'an articular facet on each side of the seventh cervical,' which, if granted, proved an extension of the thorax upward. There was also a partial blending of the first and second ribs, or there was a 'bicipital rib.' The interest of these facts appears to lie in the indicated reversion to lower animal forms. The tibiae are flattened (platynemic), with a backward inclination of their heads. Whether these remains were Aztec or Taltec, the author of this paper was unable, from known data to say.

Mr. Beutenmüller continued his able synopses and revisions of Lepidoptera.

The papers which conferred the most distinction on this volume were those relating to vertebrate paleontology. These were four in number from the pens of Professor Osborn, Dr. Wortman and Dr. Matthew. The ancestry of the dogs, foxes, otters, was discussed, by which it was shown that their descent could be traced from the Eocene, that the family of the Procyonidae (a small family holding the American raccoons) could be traced as an offshoot of the dogs in the later Eocene (Oligocene), that the South American Foxes came from North American Miocene species, and that the establishment of the new family Viverravidae was necessary. This

family was considered as "the forerunner of the Viverrine phylum whose members towards the close of the Eocene migrated to Asia."

The second paper by Dr. Wortman on *Oxyæna lupina* Cope, contained a full description of this species, typical of one family of the *Creodonts* (flesh-eaters). Dr. Matthews's paper was a careful tabulation of the fauna of the fresh water tertiary of the west. Professor Osborn contributed his third paper on Dinosaurs making a comparison of the fore and hind limbs of these extraordinary creatures, the dimensions of whose legs, in some cases, (*Brontosaurus*) reached the extreme limit of ten feet.

This twelfth volume of the Bulletin closed with a description of the Eskimo of Smith Sound by A. L. Kroeber. These were Ross' Arctic Highlanders, and the subject of Mr. Kroeber's paper was the six natives secured by Lieut. Peary and brought to this city in 1897. The implements of these singular aborigines were described, and their sociology, religion and cosmology.

These Smith Sound Eskimo are regarded as, ethnologically, similar to the Greenland Eskimo, and claims for their distinctness and insulation are repudiated.

Their religion is vague, but practically centers around the 'medicine man,' or shaman, their morals dubious, and their government formless.

Amongst shorter papers in the tenth volume was a notice of a superb specimen of *Madrepora palmata* which Professor Whitfield obtained in the Bahamas and which now forms a conspicuous ornament of the Coral collection in the Museum halls.

These Bulletins of the Museum have now an established reputation, and form a feature as important in its scientific life, as does the beautiful or appropriate exhibition of its collections in its educational work.

L. P. GRATACAP.

THE VERTEBRAL FORMULA IN *DIPLODOCUS*, MARSH.

IN the Memoirs of the American Museum of Natural History, Volume I., Part V., Professor Henry F. Osborn has given a careful and exceedingly interesting account of the skeleton of a *Diplodocus* discovered in 1897 near the Como Bluffs in Wyoming by an exploring party sent out by the American Museum.

In the summer of 1899 the expedition sent out to the fossil fields of Wyoming by the Carnegie Museum at the instance and expense of the generous founder of the institution, succeeded in discovering a second skeleton of *Diplodocus*, which furnishes information as to many portions which were lacking in the specimen belonging to the American Museum. The two specimens are in many respects complementary to each other. The specimen described by Professor Osborn consisted of the left neural arches of three cervicals; eight posterior dorsals lacking the centra; the sacrum lacking the first and second centra and consisting of four vertebræ; caudal vertebræ Nos. 1-21, and 23-27, complete with chevrons; portions of caudals 32, 33, and 35 (estimated); the ribs of the three posterior dorsals; the left ilium and ischium; the upper three-fourths of the left femur, and the right scapula. The specimen belonging to the Carnegie Museum consists of eleven cervicals, ten dorsals, four sacrales lacking the left sides of the centra, the twelve anterior caudals, with chevrons; eighteen ribs, two of them imperfect; the right ilium, and the peduncle of the left ilium; the two ischia and the two pubic bones; the right femur entire; the left scapula and coracoid coössified, and the two sternal plates. The work of excavation has not yet been completed, having been interrupted in the latter part of September, 1899, by the advent of severe weather. It has been resumed at this date and it is hoped that further uncovering of